

## PATENT COOPERATION TREATY

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INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY  
(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference P 8 024 PCT/EU		<b>FOR FURTHER ACTION</b>		See Form PCT/IPEA/416
International application No. PCT/EP2004/003889		International filing date (day/month/year) 13.04.2004	Priority date (day/month/year) 09.04.2003	
International Patent Classification (IPC) or national classification and IPC E05D15/10				
Applicant BORTOLUZZI MOBILI S.P.A. et al.				
<p>1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of 5 sheets, including this cover sheet.</p> <p>3. This report is also accompanied by ANNEXES, comprising:</p> <p>a. <input checked="" type="checkbox"/> sent to the applicant and to the International Bureau) a total of 6 sheets, as follows:</p> <p><input checked="" type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).</p> <p><input type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.</p> <p>b. <input type="checkbox"/> (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) , containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).</p>				
<p>4. This report contains indications relating to the following items:</p> <p><input checked="" type="checkbox"/> Box No. I Basis of the opinion</p> <p><input type="checkbox"/> Box No. II Priority</p> <p><input type="checkbox"/> Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</p> <p><input type="checkbox"/> Box No. IV Lack of unity of invention</p> <p><input checked="" type="checkbox"/> Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</p> <p><input type="checkbox"/> Box No. VI Certain documents cited</p> <p><input type="checkbox"/> Box No. VII Certain defects in the international application</p> <p><input type="checkbox"/> Box No. VIII Certain observations on the international application</p>				
Date of submission of the demand  15.09.2004		Date of completion of this report  25.04.2005		
Name and mailing address of the international preliminary examining authority:   European Patent Office - P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk - Pays Bas Tel. +31 70 340 - 2040 Tx: 31 651 epo nl Fax: +31 70 340 - 3016		Authorized Officer  Witasse-Moreau, C  Telephone No. +31 70 340-4370		



**INTERNATIONAL PRELIMINARY REPORT  
ON PATENTABILITY**

International application No.  
PCT/EP2004/003889

**Box No. I Basis of the report**

1. With regard to the **language**, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.
- ☐ This report is based on translations from the original language into the following language, which is the language of a translation furnished for the purposes of:
- ☐ international search (under Rules 12.3 and 23.1(b))
  - ☐ publication of the international application (under Rule 12.4)
  - ☐ international preliminary examination (under Rules 55.2 and/or 55.3)
2. With regard to the **elements\*** of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report):*

**Description, Pages**

1-19 as originally filed

**Claims, Numbers**

1-16 received on 09.12.2004 with letter of 09.12.2004

**Drawings, Sheets**

1/10-10/10 as originally filed

- ☐ a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing
3. ☐ The amendments have resulted in the cancellation of:
- ☐ the description, pages
  - ☐ the claims, Nos.
  - ☐ the drawings, sheets/figs
  - ☐ the sequence listing (*specify*):
  - ☐ any table(s) related to sequence listing (*specify*):
4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).
- ☐ the description, pages
  - ☐ the claims, Nos.
  - ☐ the drawings, sheets/figs
  - ☐ the sequence listing (*specify*):
  - ☐ any table(s) related to sequence listing (*specify*):

\* If item 4 applies, some or all of these sheets may be marked "superseded."

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**Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

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1. Statement

Novelty (N)	Yes: Claims	5-16
	No: Claims	1-4
Inventive step (IS)	Yes: Claims	5-16
	No: Claims	1-4
Industrial applicability (IA)	Yes: Claims	1-16
	No: Claims	

2. Citations and explanations (Rule 70.7):

**see separate sheet**

**Re Item V**

**Reasoned statement with regard to novelty, inventive step or industrial applicability;  
citations and explanations supporting such statement**

1. Reference is made to the following documents:  
D1: GB-A-1 439 940 (WESTINGHOUSE BRAKE & SIGNAL) 16 June 1976,  
D2: US-A-3 886 685 (RIPHAGEN REINHARD) 3 June 1975,  
D3: EP-A-0 075 364 (KAİROS SNC BONETTI MANETE MION) 30 March 1983.
2. The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claim 1 is not new in the sense of Article 33(2) PCT.

Since in the application, the two first carriages are permanently fixed to each other by the clamp (2), and that claim 1 does not exclude that the second carriages are linked, the parts (2) and (13) are interpreted as being a pair of second carriages, having a common sliding means (17).

The document D1 discloses indeed all the features of claim 1, i.e. (the references in parentheses applying to this document; see figures):  
a sliding door (1), comprising:  
a cam guide (11, 8, 9);  
a clamp (6) being adapted to support said sliding door;  
at least one shutter (1);  
a pair of first carriages (10/4/5; 10/14); and  
a pair of second carriages (2, 13), said second carriages (2, 13) being supported and guided by a rail (15), which is realized by a profile wherein the profile is placed along a length of an opening which is to be opened and closed by said sliding door, for translating said second carriages (2, 13) along said opening;  
wherein said clamp (6) is adapted to link said shutter (1) to said pair of first carriages (10/4/5; 10/14) [see page 2, lines 93-100],  
each one of said first carriages (10/4/5; 10/14) is translatable longitudinally along its respective one of said second carriages (2; 13);  
said cam guide (11) comprises grooves (8, 9) into each of which a roller (10) of said first carriages (10/4/5; 10/14) respectively can engage such that each roller (10) is movable

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(SEPARATE SHEET)**

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longitudinally coaxial to said rail (15).

3. Dependent claims 2-4 do not contain any features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect of novelty and/or inventive step (Articles 33(2) and (3) PCT, as these features are already known from D1 or are merely a matter of normal design procedure; see tracks (2, 13) and sliding roller (17) of the second carriages.
4. The combination of the features of dependent claims 5-16 is neither known from, nor rendered obvious by, the available prior art.

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### Claims

1. Sliding door, particularly for pieces of furniture (M) or similar, comprising:
- a cam guide (6);
  - a clamp (2) being adapted to support said sliding door;
  - at least one shutter (1a, 1b);
  - a pair of first carriages (3a, 3b); and
  - a pair of second carriages (4a, 4b), said second carriages (4a, 4b) being supported and guided by a rail (59), which is realized by a profile (5) wherein the profile (5) is placed along a length of an opening (V) which is to be opened and closed by said sliding door, for translating said second carriages (4a, 4b) along said opening (V);
- characterized in that:
- said clamp (2) is adapted to link said shutter (1a, 1b) to said pair of first carriages (3a, 3b),
  - each one of said first carriages (3a, 3b) is translatable longitudinally along its respective one of said second carriages (4a, 4b),
  - said cam guide (6) comprises grooves (61, 62) into each of which a roller (35) of said first carriages (3a, 3b)

respectively can engage such that each roller is movable longitudinally coaxial to said rail (59).

2. Sliding door according to claim 1, characterized in that as an effect of the possibility of longitudinal translation of the first carriages (3a, 3b) along tracks (41) of their respective longitudinal second carriages (4a, 4b), said shutter (1a, 1b) is translatable transversally with respect to the axis of the rail (59), which is orientated longitudinally to the opening (V) to be closed and opened.

3. Sliding door according to claims 1 or 2, characterized in that said shutter (1a, 1b) is linked to the pair of first carriages (3a, 3b) by means of one or more clamps (2), which bring the shutter (1) for accomplishing the movement resulting from the longitudinal translation of the second carriages (4a, 4b) along the rail (59) matched with the transversal movement of the first carriages (3a, 3b) as an effect of their respective engagement with the grooves (61, 62).

4. Sliding door according to claim 3, characterized in that each one of said first carriages (3a, 3b) is provided with rollers (31) or another sliding system, for being translatable along the tracks (41) of said second carriages (4a, 4b) which are respectively provided with a pulley (43) for sliding along the rail (59) for the support and the translation of the shutter (1a, 1b).

5. Sliding door according to claim 4, characterized by one of said first carriages (3a, 3b) being placed laterally to said shutter (1a, 1b), so that its guide roller (35) can be housed and can slide to bended ends (62a, 62b) of a long groove (62) of said grooves (61, 62) of the guide cam (6).

6. Sliding door according to claim 4 or 5, characterized by one of said first carriages (3b, 3a) being placed on the centre line of a longitudinal side of the shutter (1a, 1b), so that its guide roller (35) can be housed and can slide to bended ends (61a, 61b) of a short groove (61) of said grooves (61, 62) of the guide cam (6).

7. Sliding door according to claims 1, 5 and 6, characterized by one of said first carriages (3a, 3b) being placed respectively on an outer edge and the other one on the centre line of an upper side of the shutter (1a, 1b), said first carriages (3a, 3b) being steadily linked to the shutter (1) by means of one or more clamps (2).

8. Sliding door according to claims 1, 5 and 6, characterized by one of said first carriages (3a, 3b) being placed on the outer edge and the other one on the centre line of a lower side of the shutter (1a, 1b) by means of one or more clamps (2).

9. Sliding door according to claims 3 and 4, characterized in that the second carriages (4a, 4b), besides being provided with a pulley (43), are also provided with a sliding wheel (45) that slides on a track (53) of the



supporting profile (5), the profile (5) being also provided with a shoulder (54) for acting together with the support and guide of the shutter (1a, 1b) during the translation along the rail (59).

10. Sliding door according to claims 4 and 9, characterized in that the pulleys (43), in particular one of the second carriages (4b), have a flaring wide enough to rotate on the rail (59) even when they are lightly tilted with respect to the axis of the same rail (59).

11. Sliding door according to claim 4, characterized in that one of the second carriages (4a) is provided with a stop wheel (46) acting as a shoulder on the track (58) of the supporting profile (5), to assure the linearity of the translation of the shutter (1a, 1b), also in case of pushes or uneven thrusts.

12. Sliding door according to claims 1 and 2, characterized by combining a device for the leading and control of the wide opening of the shutter (1a, 1b) to be opened or to be closed for the respective overlapping and coplanarity, with a guide device placed on the opposite of a longitudinal side, said opposite guide device being fundamentally provided for a better distribution of the stress in phase of inclination or partial hinging of the moving shutter (1a, 1b) as an effect of the different position of the first carriages (3a, 3b) during their translation into the respective bended portions (61a, 61b; 62a, 62b) of the guide cam (6).

13. Sliding door according to claim 12, characterized by an elbow-shaped transmission shaft (73) being linked to a section (57) of the profile (5) for the support of the second carriages (4a, 4b), preferably by interposition of a roller (75) that slides on the sides of an opening (57) of the section (57), said elbow-shaped shaft (73) being steadily fixed to the shutter (1a, 1b) by means of supports (76), and an opposite extremity (72) of the shaft (73) being adjusted to slide inside an opening (71) of a guide (70) which is placed on a side opposite where the carriages and little carriage system are located.

14. Sliding door according to claims 12 and 13, characterized by an elbow-shaped transmission shaft (73) having its upper extremity (74) engaged in the opening (57) of the supporting profile (5), the upper pulley (43) and the roller (45) of the first carriage (3a, 3b) being linked to a ceiling (S) of the opening (V), the opposite extremity (72) of the shaft (43) being engaged in a linear guide (70) placed on bottom (F) of the opening (V).

15. Sliding door according to claims 12 and 13, characterized in that the linear guide (70) being linked to the bottom (F) is formed by a guide cam being identical and parallel to the guide cam (61, 62) of the ceiling (S), requiring in this case only a lower pivot for the sliding of the shutter (1a, 1b) without having to apply to the elbow-shaped shaft (73).

16. Sliding door according to claims 8, 12 and 13, characterized in that a guide cam is provided with the ceiling (S) of the opening (V) that implies the shutter (1a, 1b) to be guided and controlled by the first carriages (3a, 3b) with the second carriages (4a, 4b) being supported by clamps (2) placed on the lower side of the same shutter (1a, 1b).